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Patent claims

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1. A method for triggering an automatic emergency
braking process of a vehicle in order to avoid the
vehicle having a rear end collision with a vehicle
traveling in front and/or in order to reduce the
consequences of a rear end collision, wherein a driver
warning is triggered if at least one predefined warning
condition is fulfilled, wherein the fulfillment of the
warning condition specifies that, owing to the driving
situation of the vehicle, determined in view of the
registered acceleration (a) of the vehicle and a
predefined emergency braking deceleration (a_{NB}), the
automatic emergency braking process is to be triggered,
wherein the warning condition includes, as target
conditions, a predefined target safety distance (d_z)
and a predefined target relative speed ($v_{rel,z}$) between
the vehicle and vehicle traveling in front, which are
to be attained after the automatic emergency braking
process has finished, characterized in that, in
addition to the registered acceleration (a) of the
vehicle, the registered, currently occurring relative
acceleration (a_{rel}) between the vehicle and vehicle
traveling in front is taken into account in order to
determine the instantaneous driving situation of the
vehicle which is included in the warning condition,
wherein the automatic emergency braking process is not
to be triggered until after the driver warning has been
triggered and subsequent expiry of a predefined warning
time period (t_w).

2. The method as claimed in claim 1, characterized in
that the driver warning takes place in a way which can
be perceived visually and/or acoustically and/or

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haptically by the driver of the vehicle.

3. The method as claimed in claim 2, characterized in that a driver warning which can be perceived haptically by the driver of the vehicle takes place in the form of a partial braking process of the vehicle with a predefined partial braking deceleration (a_{TB}), wherein the predefined partial braking deceleration (a_{TB}) is smaller than the predefined emergency braking deceleration (a_{NB}).

4. The method as claimed in one of claims 1 to 3, characterized in that the automatic emergency braking process is triggered only if a given emergency braking condition is fulfilled and the predefined warning time period (t_w) has expired.

5. The method as claimed in one of claims 1 to 4, characterized in that the emergency braking deceleration (a_{NB}) is predefined in a permanent or adjustable fashion.

6. The method as claimed in one of claims 1 to 5, characterized in that the warning time period (t_w) is predefined in a permanent or adjustable fashion.

7. The method as claimed in one of claims 1 to 6, characterized in that the target relative speed ($v_{rel,z}$) is predefined in a permanent or adjustable fashion.

8. The method as claimed in claim 7, characterized in that the value of a permanently predefined target relative speed ($v_{rel,z}$) between the vehicle and vehicle traveling in front is approximately zero.

9. The method as claimed in one of claims 1 to 8,

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characterized in that the target safety distance (d_z) is predefined in a permanent or adjustable fashion.

10. The method as claimed in one of claims 1 to 9,
5 characterized in that, when the driver is active and/or when the risk of a rear end collision is reduced, the driver warning is not triggered.

11. The method as claimed in one of claims 1 to 10,
10 characterized in that, when the driver is active and/or when the risk of a rear end collision is reduced, a driver warning which has already been triggered is terminated and/or changed and/or the automatic emergency braking process is not triggered.

15 12. The method as claimed in one of claims 1 to 11, characterized in that the automatic emergency braking process is triggered automatically when the predefined warning time period (t_w) expires if the driver warning
20 is not aborted during the predefined warning time period (t_w).

13. The method as claimed in one of claims 1 to 12,
25 characterized in that an automatic emergency braking process which has already been triggered is aborted if a detected emergency braking time period (t_{NB}) and/or the predefined target relative speed ($v_{rel,z}$) and the predefined target safety distance (d_z) are attained.

30 14. The method as claimed in one of claims 1 to 13, characterized in that the driver warning is composed of at least two warning stages which are triggered in chronological succession within the predefined warning time period (t_w) of the driver warning, wherein each
35 warning stage is assigned a predefined warning stage time period.

15. The method as claimed in claim 14, characterized in that the warning stage time period is predefined in a permanent or adjustable fashion.

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16. The method as claimed in claim 14 or 15, characterized in that, after a first warning stage has been triggered, at least one further warning stage is triggered only if a predefined warning stage condition
10 which is respectively assigned to the further warning stage is fulfilled.

17. The method as claimed in one of claims 14 to 16, characterized in that, when the driver is active and/or
15 when the risk of a rear end collision is reduced, at least one of the warning stages which has already been triggered is terminated and/or further warning stages are not triggered.

18. The method as claimed in one of claims 1 to 17, characterized in that activity on the part of a driver is detected on the basis of an activation of at least one operator control element which is used, in particular, to change the longitudinal dynamics or
20 lateral dynamics of the vehicle.
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19. The method as claimed in one of claims 1 to 18, characterized in that a reduction in the risk of a rear end collision is detected by reference to a distance
30 (d), which increases over time, between the vehicle and vehicle traveling in front and/or a relative speed (v_{rel}), which decreases over time, between the vehicle and vehicle traveling in front.

20. The method as claimed in one of claims 1 to 19, characterized in that the instantaneous driving
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situation of the vehicle is determined as a function of the detected distance (d) between the vehicle and the vehicle traveling in front and/or the detected relative speed (v_{rel}) between the vehicle and vehicle traveling in front and/or the detected speed (v) of the vehicle and/or of the detected relative acceleration (a_{rel}) between the vehicle and vehicle traveling in front and/or the detected acceleration (a) of the vehicle and/or of the inclination of the roadway and/or of coefficients of friction between the roadway and the vehicle's wheels.

21. The method as claimed in one of claims 1 to 20, characterized in that, when the automatic emergency braking process is triggered, a warning is issued to vehicles traveling in front and/or vehicles traveling behind.

22. A device for carrying out an automatic emergency braking process of a vehicle in order to avoid a rear end collision of the vehicle with a vehicle traveling in front and/or in order to reduce the consequences of a rear end collision, having an evaluation unit (7), wherein, when a predefined warning condition which is stored in the evaluation unit (7) is fulfilled, a driver warning is triggered by the evaluation unit (7), wherein the fulfillment of the warning condition specifies that, owing to the instantaneous driving situation of the vehicle, which has come about in view of the registered acceleration (a) of the vehicle, and a predetermined emergency braking deceleration (a_{NB}), the automatic emergency braking process is to be triggered by the evaluation unit (7) by suitable actuation of braking means (38) of the vehicle, wherein the warning condition includes, as target conditions, a predefined target safety distance (d_z) and a predefined

target relative speed ($v_{rel,z}$) between the vehicle and vehicle traveling in front, which are to be attained when the automatic emergency braking process has finished, characterized in that, in addition to the
5 registered acceleration (a) of the vehicle, the registered, currently occurring relative acceleration (a_{rel}) between the vehicle and vehicle traveling in front is taken into account in the determination of the instantaneous driving situation of the vehicle which is
10 included in the warning condition, wherein the automatic emergency braking process is not to be triggered until after the driver warning has been triggered and subsequent expiry of a predefined warning time period (t_w).

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